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REMARKS

In the office action, the examiner rejected Claims 1-3, 6-8, 12 and 13 under 35 U.S.C. 102(b) as being anticipated by Murfin (U.S. Patent No. 2,890,295). Further, the examiner rejected Claims 1 and 7 under 35 U.S.C. 102(b) as being anticipated by Scott (U.S. Patent No. 2,173,426). The examiner stated that Claims 4, 5 and 9-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Accordingly, the applicant has amended independent Claims 1 and 7, to more clearly differentiate the features of the present invention from the technologies disclosed by the cited Murfin reference and the cited Scott reference.

More specifically, the applicant has clarified the connection of the grid resistor of the vacuum tube circuit of the present invention by reciting that "a (first) grid resistor is connected between the grid terminal of the vacuum tube and an input signal source thereby creating a voltage drop by a flow of grid current" in Claims 1 and 7. This feature is clearly supported by the original disclosure of the instant application as shown in Figures 1 and 2 and the corresponding description of the specification. For example, in Figure 1, the grid register Rg1 is connected between the grid terminal 23 and the input signal source 10 through which the grid current Ig flows.

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The vacuum tube circuit of the present invention is structured to supply a low source voltage to the plate terminal and the heater, as well as to supply a low positive voltage to the grid terminal through a grid resistor. By supplying the low positive voltage to the grid terminal through the grid resistor while supplying the low source voltage of the positive potential to the plate terminal and the heater, the vacuum tube circuit is capable of sufficiently amplifying an input signal.

As in the embodiments of Figures 1 and 2, an example of the low source voltage is +4 volt. The low source voltage is commonly supplied to the plate terminal 21 (through the resistor 40) and to the heater 25. Because of such a low voltage, the overall power consumption is very small, which makes it possible to use batteries as the power source (page 9, lines 26-34). One of the effects of the grid resistor is to control the voltage at the grid terminal 21 (page 5, lines 5-10). Another effects of the grid resistor is to create the distortion in the output waveform so as to obtain unique sound effects (page 5, lines 11-26).

The cited Murfin reference (U.S. Patent No. 2,890,295) is directed to a low frequency triode amplifier incorporating a cold cathode gas tube. Although the amplifier of the cited Murfin reference utilizes the positive voltage for the grid terminal, this is not at all an amplifier of low source voltage. For example, the plate voltage is 90V and the heater voltage is 6.3V which are separately provided.

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As shown in the drawing of the cited Murfin reference, the plate voltage and the heater voltage are separately provided, while in the present invention, the low source voltage is commonly provided to the plate terminal 21 and to the heater 25. Since the plate voltage of the cited Murfin reference is 90V which is extremely higher than the source voltage of the present invention, the separate heater voltage of 6.3V must be prepared. Because if the plate voltage of 90V is used for the heater, the heater will be immediately broken due to high power consumption and over heat. Thus, the cited Murfin reference does not show the essential feature of the present invention.

Further, as clarified in the amendment of the claims noted above, in the present invention, the grid resistor is connected between the grid terminal of the vacuum tube and an input signal source. By this structure, the grid resistor produces a voltage drop by the flow of grid current, which stabilizes the operation of the vacuum tube circuit as well as creating the unique sound effects by the distortion of the output signal. In the cited Murfin reference, however, the resistor 29 is connected between the grid and the plate, i.e., not the input signal source. Therefore, the cited Murfin reference does not show the essential feature of the present invention.

The cited Scott reference (U.S. Patent No. 2,173,426) is an amplifier which amplifying a signal of selected frequency. As shown in Figure 1 of the cited Scott reference, the resistor 75 is

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connected to the negative terminal (the lowest voltage) of the source voltage 24. Thus, the amplifier of the cited Scott reference is the traditional one using the negative voltage for the grid terminal unlike the present invention which utilizes the positive bias voltage for the grid terminal. Thus, the cited Scott reference does not show the essential feature of the present invention.

Further, as clarified in the amendment of the claims, in the present invention, the noted above, the grid resistor is connected between the grid terminal of the vacuum tube and an input signal source. By this structure, the grid resistor produces a voltage drop by the flow of grid current to control the bias voltage of the grid terminal, which stabilizes the operation of the vacuum tube circuit as well as creating the unique sound effects by the distortion of the output signal. In the cited Scott reference, although the resistor 9 is connected between the grid and the input signal source, it does not control the bias voltage of the grid terminal, because the negative voltage through the resistor 75 controls the bias voltage of the grid terminal. Therefore, the cited Scott reference does not show the essential feature of the present invention.

Since none of the essential features of the present invention are shown or suggested by the cited Murfin reference, the rejection to Claims 1-3, 6-8, 12 and 13 under 35 U.S.C. 102(b) is no longer applicable to the present invention. Further, since none of the

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essential features of the present invention are shown or suggested by the cited Scott reference, the rejection to Claims 1 and 7 under 35 U.S.C. 102(b) is no longer applicable to the present invention.


In this opportunity, the applicant has amended the specification to correct minor wording errors therein and to more clearly describe the present invention. This is to verify that no new matter has been introduced by this amendment.

Under the circumstances, the applicant believes that the present application is in condition for allowance, and the applicant respectfully requests that the present application be allowed and passed to issue.

Respectfully submitted,

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